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Free boundary conditions at austenite-martensite interfaces

caltech.edu [PDF]

OP Bruno, PH Lee, F Reisch - Physical review letters, 1995 - APS

... (Note that in our dynamic con- figuration and due to the additional dissipative stress, the actual strains in the austenite and martensite ... The free boundary problem (1)-(4) can be used to de- rive simple expressions in closed form giving observables such as the width of the ...

Cited by 30 - Related articles - BL Direct - All 6 versions

[citation] Heat conduction or diffusion with change of phase

SG Bankoff - Advances in chemical engineering, 1964

Cited by 91 - Related articles

Nonequilibrium thermodynamics of pseudoelasticity

Y Hao, I Müller - Continuum Mechanics and Thermodynamics, 1993 - Springer

... Here U , K , S are the internal energy, kinetic energy and entropy of the body, q_i is the heat flux, t_{ij} the Cauchy stress tensor, v_i the velocity, n_i the outer normal and dA the area element on the boundary ∂B Thus the specific free energies $f := F/m$ of the austenite and martensite ...

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... of free energy of δ -ferrite/ γ -austenite interphase boundary of low carbon steels by ...

HYin, T Eni, H Shibata - ISIJ International, 1998 - Journal@archive

... hot-direct-rolling process and in mini-mills with thin- slab-casting process, finer austenite (γ) grains are prerequisite because most of ferrite (α) grains nucleate and grow at the γ -grain boundary (referred as GB hereafter). ... γ -grains in -matrix and hence the free energy of γ IB ...

Cited by 17 - Related articles - BL Direct - All 6 versions

The free energy of mixing for n-variant martensitic phase transformations using ...

wias-berlin.de [PDF]

S Govindjee, A Mielke, GJ Hall - Journal of the Mechanics and Physics of ..., 2003 - Elsevier

... Lack of the wisc property implies non-existence of a minimizing deformation for given boundary data and hence indicates the formation of ... In this paper, we do not directly address the evolutionary problem, rather we consider in some detail the free energy density of the ...

Cited by 65 - Related articles - BL Direct - All 14 versions

Application of a partially relaxed shape memory free energy function to estimate ...

GJ Hall, S Govindjee - Journal of the Mechanics and Physics of Solids, 2002 - Elsevier

... in every way save orientation, the resulting function must have multiple "wells" corresponding with austenite and each ... see Ericksen (1986), and (1). (Kohn, 1991), where $W \alpha$ is the free energy of ... a body made of such a material will evolve under a given set of boundary conditions ...

Cited by 23 - Related articles - BL Direct - All 4 versions

Thermodynamics controlling the proeutectoid ferrite transformations in Fe-C-Mn ...

JB Gilmour, GR Purdy, JS Kirkaldy - Metallurgical and Materials ..., 1972 - Springer

... The paraequi- librium boundaries project to the true binary equilb- rium on the Fe-C side and to the To composition (the point where austenite and ferrite of the same composi- tion have equal free energy) on the Fe-Mn side. ...

Cited by 82 - Related articles - All 3 versions

Couplings between plasticity and martensitic phase transformation: overall ...

M Cherkasov, M Berveiller, X Lemoine - International Journal of Plasticity, 2006 - Elsevier

... In order to obtain the driving force acting on the moving boundary, the two-phase martensitic-austenitic material can be ... the dissipation is given by the difference between the power developed by the external forces and the variation of the Helmholtz free energy chosen as a ...

Cited by 49 - Related articles - BL Direct - All 5 versions

The multiphase-field model with an integrated concept for modelling solute ...

J Tiaden, B Nestler, HJ Diepers, I Steinbach - Physica D: Nonlinear ..., 1998 - Elsevier

... 2. The free energy difference is then defined in the standard way by the latent heat L and the ... The amount of carbon in the ferrite at the phase boundary to the liquid always tends to adjust the equilibrium ... austenite grows under simultaneous dissolution of δ ferrite and of the liquid ...

Cited by 130 - Related articles - All 6 versions

Modelling the evolution of phase boundaries in solids at the meso-and nano- ...

northwestern.edu [PDF]

K Thornton, J Agren, PW Voorhees - Acta Materialia, 2003 - Elsevier

... We expect that ab initio calculations of interfacial free energies will become much widely available ... After analyzing available experimental information on the massive ferrite/austenite transformation, recrystallization and grain ... [70 and 71] investigated grain boundary migration in ...

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